

BELEN'KIY, Il'ya Markovich; YAKOVLEVA, B.M., red.; D'YACHENKO,  
V.M., red.; GOLUBKOVA, L.A., tekhn. red.

[Settling the accounts with collective and state farms for  
the receipt of grain and seeds] Raschety s kolkhozami i sov-  
khozami za priniatye zerno i semena. Pod red. B.M. Iakovleva.  
Izd. 4., dop. i perer. Moskva, Zagotizdat. 1962. 114 p.  
(MIRA 15:7)

(Grain trade--Accounting)  
(Seed industry--Accounting)

YAKOVLEVA, D. M.

~~YAKOLEVA, B. M.~~

23189 K Stat'e B. M. Yakovleva ((Spryamlyayushcheye chislo v raschetakh elektroprivodov)) (Zhurn. ((Elektrichestvo)) 1947, No. 6 Stat'i): A. N. Iroshnikov; B. M. Yakovleva. Elektrichestvo, 1949, No. 7, c. 80-81.

SO: LETOPIS' NO. 31, 1949.

BOBROVA, L.A.; BIKTASHEVA, R.A., red. NIGMATULLINA, N.S.,  
red.; SIMONOV, V.D., red.; TAROVLEVA, D.S., red.

[Molecular sieves, new industrial adsorbents; abstracts  
of lectures to aid chemistry teachers] Molekuliarnye sita -  
novye promyshlennye adsorbenty; konspekt lektsii v pomoshch'  
uchiteliam khimii. Ufa, Bashkirskii in-t usovershenstvova-  
niia uchitelei, 1963. 89 p. (MIRA 18:11)

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*\*Optical Method of Determining the Orientation of Single Crystal Specimens.*  
E. S. Yakovleva (*Zhurnal eksperimental'noy i teoreticheskoy fiziki* (Journal of Experimental and Theoretical Physics), 1933, 3, (5), 454-459).—[In Russian.]  
A modification of A. W. Schubnikov's method (*Z. Krist.*, 1931, 78, 111) is described for the determination of the inclination of any face of a metal crystal to the axis of the specimen and its crystallographic index. The apparatus, preparation of specimens, method of etching, experimental procedure, and calculation of the results are described. The results are accurate to  $30''-1'$ .  
—S. A.

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<p>04</p>																										<p>Distortion of the zinc crystal lattice during mechanical twinning. R. S. Yakovleva and M. D. Michalov. <i>J. Tech. Phys. (U. S. S. R.)</i> 5, 1085-92(1975). Mono-crystals of zinc prepd. by the Bridgeman method were deformed by stretching, some giving purely twinning and the remainder deforming chiefly through slip, then treated with HCl and subjected to recrystn. Photographs were taken after each recrystn. The centers of recrystn. occur on the border of the twin and the original crystal. With further growth of the nuclear grain the spreading goes on at first within the region of the twin. On crystals deformed only by twinning the recrystn. is limited to the region of the twin. On crystals first deformed by slipping and then twinned, the grain develops beyond the limits of the twinned region. At the tempering temp. (300-400°) centers of recrystn. were observed in places not contg. twins. The twinning of Zn is accompanied by a sharp blurring of the interference spots on the Laue x-ray diagram.</p> <p>P. H. Rathmann</p>																										<p>1</p>																									
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Jump-like deformation of zinc crystals. R. S. Yakovlev and M. V. Yakutovich. *J. Tech. Phys.* (U. S. S. R.) **35**, 1744-50 (1965). — The jump-like deformation is a result of change of the kinetics of slip with temp. In stretching a Zn crystal the deformation of one jump is distributed along the whole length of the crystal. The traces of slip, along the whole length of the crystal, become sharp in the weakly marked after the first jump, become sharp in the following jumps. The force diagram of a single jump has 3 parts: (1) the resistance to deformation falls below the applied force; (2) the resistance rises above the applied force and (3) the resistance falls but does not reach the applied force. The remaining resistance is reduced during rest, and when the resistance of the crystal becomes equal to the applied force, the jump is repeated. The remaining resistance can be explained by the exhaustion of "active" nonhomogeneities and weakening by their restoration. P. H. Rathmann

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<p>Optical method of determining the texture of transformer steel. E. S. Yakovleva. <i>J. Tech. Phys.</i> (U. S. S. R.) 9, 1280-5(1939).—Light reflection from electrolytically etched surfaces allows detn. of the orientation of grains in metals. A steel (3.6% of Si) with grains between 5 and 0.5 mm. had, c. <math>\alpha</math>, 37% of grain (cube) edges in the direction of rolling <math>=10^\circ</math>; 54% of the cube faces were inclined to the rolling plane under the angles of <math>30-42^\circ</math>.</p> <p>J. J. Hukerman</p>																									
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																									

YAKOVLEV, E. S.

7834 AEC-11-2264  
 THE DEPENDENCE OF THE CRITICAL SHEAR STRESS FOR TWINNING AND SLIP IN CRYSTALS OF CADMIUM ON THE SPECIMEN DIAMETER. E. S. Yakovleva and M. V. Yakutovich. Translated by Steven J. Rothman from Zhur. Eksp'l. i Teoret. Fiz. 10, 1146-50(1940). 7p.  
 The critical stress for twinning,  $T_1$ , and for slip,  $T_2$ , of Cd crystals of diameter 0.09 to 0.7 mm have been measured. With a decrease of crystal diameter to 0.1 mm a significant increase (about 9 times) of the stress for twinning and a lesser (about 2 times) increase of the stress for slip were found. A qualitative explanation of the observed dependence of  $T_1$  and  $T_2$  on the crystal diameter is given. (auth)

YAKOVLEVA, E. S.

YAKUTOVICH, M. V., YAKOVLEVA, E. S.

Determination of the Impact Ductility of Thin Sheet Material.  
Zav. Labor. No 10, 1947.

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
COMMON ELEMENTS																										COMMON VARIABLES INDEX																									
<div style="display: flex; justify-content: space-between;"> <span>B</span> <span>8</span> </div> <div style="text-align: center;"> <p><b>Formation of Cracks in Steel During the Martensite Transformation.</b> (In Russian.) E. S. Yakovleva and M. V. Yakutovich. <i>Zhurnal Tekhnicheskoi Fiziki</i> (Journal of Technical Physics), v. 18, Jan. 1948, p. 71-74.</p> <p>Formation of micro and macro cracks during tempering was investigated. It is shown that all cases can be explained by one of two schemes. Artificial crack formation according to one of the schemes was produced in small specimens of different carbon contents.</p> </div>																																																			
<div style="display: flex; justify-content: space-between;"> <div> <p>AS H-SLA</p> <p>RETAILLURGICAL LITERATURE CLASSIFICATION</p> </div> <div> <p>ALUMINUM</p> <p>INDEX</p> </div> </div>																																																			

1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
PROCESSES AND PROPERTIES INDEX																			
<p><b>B</b></p> <p><b>Residual Stresses in Carburized Steel Plates, Quenched from Below Ac.</b> E. S. Yakovleva and M. V. Yakutovich. Henry Bratcher (Altadena, Calif.), Translation No. 2127, 1948, 7 pages. From <i>Zhurnal Tekhnicheskoi Fiziki</i> (Journal of Technical Physics), v. 18, no. 2, 1948, p. 207-210.</p> <p>Previously abstracted from original sources under title "Residual Stresses in Case-Hardened Steel Specimens, Quenched from Temperatures Below Ac."</p>																			
<p><b>Y</b></p>																			
COMMON ELEMENTS																			
COMMON VARIABLES INDEX																			
ASME SLA METALLURGICAL LITERATURE CLASSIFICATION																			
MATERIALS INDEX										AVIATION INDEX									
1ST AND 2ND ORDERS										1ST AND 2ND ORDERS									
<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20</p>										<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20</p>									

YAKOVLEVA, E. S.

Expansion diagram of silicon iron shows low and high temperature types. Describes in detail state of diagram for various temperatures. Adduces temperature relationship, resistance to:

18/49T92

"Zhur Tekh Fiz" Vol XVIII, No 11 70-1449-1450

"Expansion of Polycrystalline Silicon Iron (4.25 Si) Within the Temperature Range -195° to 800° C," G. N. Kolesnikov, E. S. Yakovleva, M. V. Yakutovich, Inst Phys of Metals, Ural Affiliate, Acad Sci USSR, Sverdlovsk, 7 pp

USSR/Metals  
Steel, Silicon  
Stress Analysis

Nov 48

18/49T92

18/49T92  
USSR/Metals (Contd) Nov 48  
deformation, time deformation, proportional elongation, and sum of proportional and quasi-proportional elongations. Refutes the expression, suggested by F. F. Vitman, and V. A. Stepanov for relation of limits of yield to absolute temperature in wide interval of temperatures. Submitted 23 Apr 48.

13

**Mechanical Properties of a Silver-Copper Alloy (7.8% Cu) Under Tensile Stress.** (In Russian.) G. N. Kolesnikov, E. S. Yakovleva, and M. V. Yakulovich. *Zhurnal Tekhnicheskoi Fiziki* (Journal of Technical Physics), v. 19, Mar. 1949, p. 347-354.

Tensile-strength diagrams from 20 to 100°C. were obtained for the above in the hardened and aged conditions. Existence of "low-temperature" and "high-temperature" types of tensile-strength diagrams is indicated. Tensile-strength diagrams for the hardened condition are shown to have "saw-tooth" shape at temperatures of 150°C. and above. For both types of stress, dependence of resistance to deformation, yield strength, and elongation on temperature are indicated. Data are charted.

ASS-354 METALLURGICAL LITERATURE CLASSIFICATION

YAKOVLEVA, E. S.

PA-163T98

USSR/Physics - Twinning  
Strength of Materials

Apr 50

"Influence of Twinning Upon the Brittle Collapse  
of Zinc Crystals," E. S. Yakovleva, M. V. Yakuto-  
vich

"Zhur Tekh Fiz" Vol XX, No 4, pp 420-423

It can be stated that effect of twinning must be  
observed during tension of zinc crystals, which  
are oriented (hexagonal axis) perpendicularly to  
direction of tension, and during absence of deform-  
ation by slippage, since reasoning remains the same.  
Submitted 30 Nov 48.

163T98

N

5

7002  
INVESTIGATION OF DEFORMED ALUMINUM CRYSTALS  
WITH THE ELECTRON MICROSCOPE. M. V. Yakovlevich,  
E. S. Yakovleva, R. M. Lerrman, and N. N. Dulnov.  
Izvest. Akad. Nauk S.S.S.R. Ser. Fiz. 15, 383-8 (1951) May-  
June. (In Russian)

Electron-microphotographs illustrating the structural  
changes resulting from 4, 20, and 40% deformation of Al  
single crystals at various temperatures are presented, and  
the deformation mechanism is discussed.

Apr. 1952

YAKOVLEVA, E. S.

USSR/Engineering - Metallurgy,  
Deformation of Al

21 Jun 53

"Role of Grain Boundaries in the Process of Plastic  
Deformation of Aluminum," E. S. Yakovleva and M. V.  
Yakutovich

DAN SSSR, Vol 90, No 6, pp 1027-1029

Investigate effect of temp on localization of de-  
formation along grain boundaries of Al using two  
methods. At low temp and fast deformation the grain  
boundaries resist sliding deformation; at high temp  
and slow deformation, the grain boundaries are the  
weakest spots. Presented by Acad I. P. Bardin  
28 Apr 53.

269T47

*Evaluation B-77406*

YAKOVLEVA, E. S.

USSR/Physics - Zinc in Aluminum-Base Alloys

FD 377

Card 1/1

Author : Yakovleva, E. S.

Title : The influence of zinc concentration on the mechanical properties of a solid solution of zinc in aluminum

Periodical : Zhur. tekhn. fiz. 24, 544-548, Mar 1954

Abstract : Experimentally establishes that alloying of aluminum with small amounts of zinc reduces while larger additions of zinc improve mechanical properties of aluminum-base alloy. Suggests two explanations for this phenomenon: first explanation follows from studying mechanism of plastic deformation in alloys with various additions of zinc; second is based on changes in solubility of hydrogen in aluminum under effect of alloying zinc. Twelve references, 5 USSR, 1937-1952. Diagrams.

Institution :

Submitted : October 6, 1953

4

Electrical conductivity, viscosity, and density of the system  $\text{SnBr}_4\text{-HOAc}$ . M. Usanovich and E. Yakovleva. Zhur. Obshchei Khim. 25, 1312-1313 (1951). The isotherms of viscosity and of elec. cond. indicate the formation of a thermally-unstable complex compd. of undetd. compn. The interaction is apparently of an acid-base character, as evidenced by the elec. cond.

R. M. Ekin

①

MST

137-58-6-13322

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 309 (USSR)

AUTHORS: ~~Yakovleva, E. S.~~, Syutkina, V. I.

TITLE: The Mechanism of Plastic Deformation of Aluminum-magnesium Solid Solutions (Mekhanizm plasticheskoy deformatsii alyuminiyevo-magniyevykh tverdykh rastvorov)

PERIODICAL: V sb.: Issled. po zharoprochn. splavam. Vol 2. Moscow, AN SSSR, 1957, pp 266-274

ABSTRACT: Microscopic and x-ray methods were employed in an investigation of the effect of concentration of an alloying element on the mechanism of plastic deformation (D) of a binary solid solution of Mg in Al. Alloys containing 0.01, 0.04, 0.10, 0.30, and 0.92% Mg were studied. The specimens (S) were in the form of strips having dimensions of 50x3x1.8 mm. The grain size in all alloys was 0.01 mm. After electropolishing, the annealed S's were stretched in a machine at a rate of 0.2%/sec at temperatures of -193, +18, and +250°C. In addition, at 250°C, all S's were subjected to creep tests at rates of  $2-4 \times 10^{-3}$  %/hr. As a result of investigations of two degrees of D, corresponding to elongations of 2% and 13%, it was

Card 1/2

137-58-6-13322

The Mechanism of Plastic Deformation (cont.)

established that the employment of Mg as an alloying element results in a more uniform distribution of slip D in Al grains. As the Mg content is increased, the spacing between slip traces decreases together with the magnitude of the shear in the slip traces. Within the investigated interval of temperatures, the D, carried out at a rate of 0.2%/sec, produced crumbling of grains into disoriented zones of three different sizes. The extent of disorientation of such zones attains a magnitude of  $1^{\circ}30'$  and is very stable. As the Mg content is increased, disoriented zones appear in regions included into deformation strips. High-temperature plastic D is accompanied by slipping along grain boundaries; the magnitude of the slipping decreases nonmonotonously with increasing Mg content in the alloy and attains a minimum when the Mg content is 0.1%. The hardening of the Al, resulting from the appearance of Mg atoms in the alloy, is explained by the following factors: a more complete inclusion of the entire volume of metal grains into the D process; increased magnitude of heterogeneous stresses within grains producing fragmentation of grains into strongly disoriented zones and intensification of processes of rising diffusion resulting in relaxation of the stresses in the grains; a reduction in the mobility of lattice distortions owing to the formation of clouds of Mg atoms in the vicinity of the dislocations. V.N.

Bibliography: 34 references. 1. Aluminum-magnesium alloys--Deformation 2. Aluminum-magnesium alloys--Mechanical properties 3. Aluminum-magnesium alloys--Test results  
Card 2/2 4. Aluminum-magnesium alloys--Microscopia analysis 5. Aluminum-magnesium--X-ray  
6. Grains (Metallurgy)--Metallurgical effects

AUTHOR: Yakovleva, E.S.

120

TITLE: Mechanism of plastic deformation and mechanical properties of aluminium.  
I. Study of the mechanism of plastic deformation of aluminium from the traces forming on its surface during stretching.  
(Mekhanizm plasticheskoy deformatsii i mekhanicheskie svoystva alyuminiya. I. Izuchenie mekhanizma plasticheskoy deformatsii alyuminiya po sledam, vznikayushchim na ego poverkhnosti pri rastyazhenii.)

PERIODICAL: "Fizika Metallov i Metallovedenie." (Physics of Metals and Metallurgy), 1957, Vol.IV, No.1 (10). pp. 141-144, (U.S.S.R.)

ABSTRACT: See also Part II "On the block-formation in aluminium grains during plastic deformation", same issue, pp. 145-150. The main aim was to study the mechanism of plastic deformation in polycrystalline aluminium within a wide range of temperatures, -196, +18 and +250 °C, a wide range of rates of deformation  $7.3 \times 10^4$ , 73 and 2.3%/hr (at 250 °C tests were carried out additionally at the creep speeds of 0.1 and  $4 \times 10^{-3}$ %/hr.) Wires of 1.7 - 2.0 mm dia. with a rated length of 31 mm of aluminium containing 0.0014% Si, 0.001% Cu, 0.001% Fe and traces of zinc, magnesium and manganese were used. The results are entered in the graphs, Figs. 7 and 8 and photographs of the structures for various conditions of deformation are given in Figs. 1 - 6 and 9 - 14. An increase

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Mechanism of plastic deformation and mechanical properties of aluminium.

I. Study of the mechanism of plastic deformation of aluminium from the traces forming on its surface during stretching. (Cont.)

in the temperature and a decrease in the speed of deformation have the same effect. The wide range of investigations enable them to study the transition from the glide to the diffusion mechanism of deformation at the temperature of 250 °C. It was established that the transition is gradual and is caused by decreasing the length of the displacement along the glide plane and increasing localised deformation along the grain boundaries. At the lowest tensile strain rates the deformation is accompanied by sub-division of grains into large blocks. The observed dependence of the mechanism of the plastic deformation on the conditions of deformation is determined to a considerable extent by the difference in the quantity and the character of the lattice distortions which existed in the aluminium prior to deformation, and also by the formation and cessation of distortions during the process of deformation itself. 15 figures including two graphs. 11 references, 5 of which are Russian.

Institute of Metal Physics,  
Ural Branch of the Ac.Sc.

Recd. July 28, 1956.

AUTHOR: Yakovleva, E.S.

121

TITLE: Mechanism of plastic deformation and mechanical properties of aluminium.

II. Block formation in aluminium grains during plastic deformation. (Mekhanizm plasticheskoy deformatsii i mekhanicheskie svoystva alyuminiya. II. Blokoobrazovanie v zernakh alyuminiya pri plasticheskoy deformatsii.)

PERIODICAL: "Fizika Metallov i Metallovedenie", (Physics of Metals and Metallurgy), 1957, Vol.IV, No.1 (10).pp. 145-150 (U.S.S.R.)

ABSTRACT: See also Part I "Study of the mechanism of plastic deformation of aluminium from the traces forming on its surface during stretching", pp.141-144 of the same issue. The Laue pattern method and metallographic investigation in polarised light were applied for studying the dimensions and the degree of misorientation of blocks forming in aluminium during its deformation at various temperatures and strain rates. The metallographic method is based on the ability of an oxide film to rotate the plane of polarisation. In the same way as in Part I the deformation was studied at -196, +18 and +250 °C at the same rates of deformation. The results are described and illustrated by one graph and twelve photographs. It was found that during plastic deformation in aluminium grains a reorientation of the areas takes place. The size of the blocks and the degree of the misorientation is non-uniform

Mechanism of plastic deformation and mechanical properties of aluminium.

II. Block formation in aluminium grains during plastic deformation. (Cont.)

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if the conditions of deformation of the specimens differ. At low temperatures these areas consist of slightly misorientated blocks. The total angle of the misorientation of the blocks for a strain of 2% does not exceed one degree. With increasing deformation the misorientation increases and the block dimensions decrease, reaching the order of  $10^{-4}$  cm at a strain of 18%. At elevated temperatures the misorientated areas consist of a small number of blocks; the total misorientation angle at the beginning of the deformation is lower than at lower temperatures. With increasing strains at higher rates of deformation the number of blocks in the grains increases to some extent and if the speed reaches  $10^{-3}$ %/hr the quantity of the blocks in the grains decreases with increasing deformation and remain unchanged when the block dimensions become equal to the grain dimensions. The relation between the dimensions and the degree of deorientation of the blocks as a function of the conditions of deformation was found to be due to differences in the magnitude of non-uniform stresses in the grains resulting from their interaction along the boundaries. 7 references, 2 of which are Russian.

Institute of Metal Physics

Ural Branch of the Ac.Sc.

Recd. July 28, 1956

AUTHOR: Yakovleva, E. S.

126-2-16/30

TITLE: Mechanism of plastic deformation and the mechanical properties of aluminium. III. The role of the mechanism of plastic deformation in the formation of the mechanical properties of aluminium. (Mekhanizm plasticheskoy deformatsii i mekhanicheskoye svoystva alyuminiya. III. Rol' mekhanizma plasticheskoy deformatsii v formirovani mekhanicheskikh svoystv alyuminiya).

PERIODICAL: "Fizika Metallov i Metallovedeniye" (Physics of Metals and Metallurgy), Vol.IV, No.2, 1957, pp.306-309 (USSR).

ABSTRACT: An attempt is made to elucidate the relation between the mechanism of plastic deformation and the mechanical properties of pure aluminium. As in Parts I and II (same journal, 1957, Vol.IV, No.1) the mechanism of deformation was studied for aluminium of the grade AB000 (99.99% Al, 0.0035% Fe, 0.0025% Si, 0.005% Cu). The mechanical properties were determined from the diagram of elongations obtained at -196, +18 and +250 C at speeds equalling  $7.3 \times 10^4$ , 73 and 2.3%/hour. The deformation was effected on a machine for stretching thin wires which enabled the obtaining of the elongation diagram on a photographic plate (2). It was found that the main factors determining the resist-

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Mechanism of plastic deformation and the mechanical properties of aluminium. III. The role of the mechanism of plastic deformation in the formation of the mechanical properties of aluminium. (Cont.)

126-2-16/30

tance to deformation of pure aluminium are the bond forces, the structural non-uniformities and the mechanism of plastic deformation of the metal. The observed plastic unequal resistance to deformation of aluminium at various temperatures and stretching speeds is attributed predominantly to the difference in the non-uniformity of its structure and the mechanism of plastic deformation.

Card 2/2 There is 1 graph. There are 9 references, 4 of which are Slavic.

ASSOCIATION: Institute of Metal Physics, Ural Branch, Ac.Sc.USSR.  
(Institut Fiziki Metallov Ural'skogo Filiala AN SSSR).

SUBMITTED: June 28, 1956.

AVAILABLE:

AUTHORS: Syutkina, V. I. and Yakovleva, E. S. 126-5-3-15/31

TITLE: The Influence of Magnesium on the Plastic Deformation of Aluminium-Magnesium Alloys (Vliyaniye magniya na mekhanizm plasticheskoy deformatsii alyuminiyevomagniyevykh splavov)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol. 5, Nr 3, pp 501-507 + 2 plates (USSR)

ABSTRACT: Polycrystalline test-pieces in the form of strips were manufactured from solid solutions of magnesium in aluminium containing respectively 0.00, 0.01, 0.04, 0.10 and 0.30% magnesium. The grain size was almost constant. Specimens of each composition were electropolished and subjected to extensions of 2% and 14% at a rate of 0.2% per sec at temperatures of  $-196^{\circ}\text{C}$ ,  $18^{\circ}\text{C}$  and  $250^{\circ}\text{C}$ , and to extensions of 2% and 14% at  $4 \times 10^{-3}\%$  per hour at  $250^{\circ}\text{C}$  only. The surfaces of the deformed specimens were examined microscopically, the authors distinguishing between straight and curved slip lines and slip bands. The distance between slip lines was measured and interferometric methods were used to determine the slip displacement and the displacement along the grain boundaries. With specimens extended to 2% at 0.2% per sec the displacement in the straight slip lines was almost

Card  
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The Influence of Magnesium on the Plastic Deformation of Aluminium-Magnesium Alloys

126-5-3-15/31

constant at 0.1μ for all magnesium contents. Increase in the magnesium content tended to decrease the distance between slip lines. Curved slip lines occurred, evidently at 250°C only, in alloys of magnesium contents up to 0.1%, the displacement in them decreasing and the distance between them increasing with increasing magnesium content. With strong alloying deformation bands appeared. The displacement along the grain boundaries varied in a non-monotonic way with magnesium content having a minimum at 0.1% magnesium. In specimens extended to 2% at  $4 \times 10^{-3}\%$  per hour no slip lines appeared. The displacement along grain boundaries, however, was again a minimum for a magnesium content of 0.1%. 14% extension produced a coarser distribution of slip phenomena. The same general dependence of displacement in, and separation between, slip lines on the magnesium content was observed. Though graphs are given for the behaviour of the curved slip lines, it is stated that in this respect differences between grains were great. Slip bands were always present; their number and the displacement in them increased with

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2/3

126-5-3-15/31

The Influence of Magnesium on the Plastic Deformation of Aluminium-Magnesium Alloys

increasing magnesium content. The grain boundary displacement showed the same dependence on magnesium content as in the previous cases. These observations were explained qualitatively on the basis of the lattice distortions produced by the presence of magnesium atoms, it being suggested that the distortions blocked the progress of dislocations.

There are 13 figures and 13 references, 10 of which are Soviet, 2 English.

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR  
(Institute of Metal Physics, Ural Branch of the Ac.Sc., USSR)

SUBMITTED: October 15, 1956

- : 1. Aluminum-magnesium alloys--Deformation 2. Magnesium--Metallurgical effects 3. Aluminum-magnesium alloys--Test results

Card 3/3

YAKOVLEVA, E. S.

with V. A. PAVLOV, and M. V. YAKUTOVICH

"Effect of Small Amounts of Addition Agents on Creep of Solid Solutions" p. 48

"Effect of Small Additions of Titanium, Molybdenum, and Tungsten on the Mechanical Properties of Iron-Chrome-Nickel Alloys" p. 58

"Distribution of Strain in Grains of Aluminum and Aluminum-Zinc Alloys in Creep" p. 65

Problems in the Theory of Heat Resistance of Metal Alloys, Moscow, Izd-vo AN SSSR, 1958, 160 pp. (Trudy, <sup>No. 19</sup> Inst. Fiz. Metal., Ural filial, AN SSSR)

The articles in this book constitute reports on extensive studies, conducted between 1949-and 1954 by the Inst. Physical Metallurgy Urals Branch AS USSR, and devoted to the development of a general theory of heat resistance.

AUTHORS: Syutkina, V. I. and Yakovleva, E. S. SOV/126-6-2-20/34

TITLE: Sub-structure of grains of deformed aluminium-magnesium alloys (Substruktura zeren deformirovannykh alyuminiyevomagniiyevykh splavov)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 2, pp 326-333 (USSR)

ABSTRACT: For a series of aluminium-magnesium alloys the sub-structure was studied which forms during the deformation within a wide range of temperatures and drawing speeds. Alloys were investigated containing 0.00; 0.01; 0.04; 0.10; 0.30; 0.92% magnesium and which were manufactured from an aluminium containing 0.001% Fe, 0.0014% Si, 0.0011% Cu and traces of zinc, magnesium and manganese; the magnesium used was electrolytically manufactured and chemically pure. The average linear grain dimensions were the same for all alloys in the initially annealed state, equalling 0.1 mm. Deformation was effected on a machine intended for applying tensile stresses on thin specimens at the temperatures -196, +20 and +250°C with a deformation speed of 0.2%/sec. The sub-structure of the grains was investigated for two degrees of

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SOV/126-6-2-20/34

Sub-structure of grains of deformed aluminium-magnesium alloys

deformation equalling 2 and 14%. Furthermore, after testing, all the alloys were investigated for creep at 250°C with a speed of  $4 \cdot 10^{-3}$  %/hr and a deformation corresponding to a 2% extension. The specimens consisted of strips of 2 x 1 x 50 mm. The investigations were effected by using the Laue X-ray method and by the optical polarisation method. The influence of magnesium on the block formation was studied by the X-ray method on the basis of the magnitude and the character of the radial blurring of the Laue patterns, which were obtained using the continuous radiation spectrum of copper. The polarisation method enables visual observation of the formation of deorientated sections in the grains; the sensitivity of this method is low and the sub-structure in the grains can be observed if the deorientation of adjacent sections exceeds 0.5 to 1°. This method was used for studying the sub-structure occurring at the later stages of deformation equalling 14 to 15%. Some of the obtained Laue patterns are reproduced (Figs. 1 and 2) as well as micro-photos taken with polarised light indicating the block formation in the specimens (Figs. 3, 4).

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SOV/126-6-2-20/34

Sub-structure of grains of deformed aluminium-magnesium alloys

It was established that alloying of aluminium with magnesium brings about a change in the sub-structure of the grains occurring during deformation. For all the applied temperatures and deformation speeds, the dimensions of the blocks which form in the regions enclosed between the slip traces decrease with increasing Mg content. Furthermore, the quantity and also the degree of deorientation of large deorientated sections also increase. The influence of magnesium in the alloy on the decrease of the dimensions of the sub-structure blocks is most pronounced at high deformation temperatures. The change in the number and the degree of deorientation of the large deorientated sections can be clearly observed at all temperatures. The refining of the blocks of the sub-structure is due to two causes: decrease of the distance between the slip traces (i.e. the width of the area where blocks occur) and decrease of the mobility of the lattice distortions which form the block boundaries. The decrease in the mobility of the distortions can be brought about by appearance in these of magnesium atoms.

Card 3/5 The formation of large deorientated sections in the

Sub-structure of Grains of Deformed Aluminium-Magnesium Alloys

SOV/126-6-2-20/34

grains during deformations is the consequence of non-uniform stresses occurring in the grains due to interaction between grains. The increase in the quantity and the degree of deorientation of such sections with increasing magnesium content in the alloy indicates an increase in the non-uniform stresses inside the grains. Such an increase can take place since, according to Green, Pavlov et alii (Ref.15), the magnesium hardens the alloy. Furthermore, it is known that with increasing magnesium content the grain boundaries will harden more than the body of the grain; this brings about a reduction of the stress relaxation at the boundaries and intensifies the interaction of the grains. The refining of the block structure and the growth of non-uniform stresses in the grains with increasing magnesium content in the alloy are to a large extent decisive from the point of view of high coefficient of hardening of aluminium-magnesium alloys. It is necessary to point out that qualitatively magnesium brings about the same type of deformation sub-structure

Card 4/5

Sub-structure of Grains of Deformed Aluminium-Magnesium Alloys SOV/126-6-2-20/34

in aluminium as the reduction of the deformation temperature.

There are 4 figures and 16 references, 6 of which are Soviet, 9 English, 1 German.

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR  
(Institute of Metal Physics, Ural Branch of the Ac.Sc., USSR)

SUBMITTED: December 26, 1956

Card 5/5

1. Aluminum alloys--Analysis 2. Grains (Metallurgy)---  
Structural analysis 3. Alloys--X-ray analysis 4. Alloys--  
Test results

81517

SOV/137-59-5-10817 ..

18. P200

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, pp 194 - 195 (USSR)

AUTHOR: Yakovleva, E.S.

TITLE: A Microscopic Investigation Into the Plastic Deformation Mechanism of Metal and Alloys 26

PERIODICAL: Tr. In-ta fiz. metallov, Ural'skiy fil. AS USSR, 1958, Nr 20, pp 265 - 272

ABSTRACT: Data are presented on microscopic investigations of Al-Mg and Ni-Cu alloys deformed at various temperatures and deformation speeds. It was stated that at low temperatures and high deformation speeds the grain boundaries inhibited the expansion of deformations. At high temperatures and low speeds of deformation the grain boundaries were the points of localized deformation. For  $\delta$  30%, within a range of  $-196^{\circ}$  to  $+250^{\circ}\text{C}$ , the deformation speed of Al decreases by a factor of 8. With raising temperatures and decreased deformation speed, the shift becomes discontinuous and branching; the coarseness of the domain structure of the grains increases. With a higher Mg content in the Al-Mg alloy, the shift

Card 1/2

81517

SOV/137-59-5-10817

A Microscopic Investigation Into the Plastic Deformation Mechanism of Metals and Alloys

in the grains becomes more uniform and straight-lined, the deformation along the grain boundaries decreases. It is stated that the 8-fold decrease of the deformation speed in Al within a temperature range of  $-196^{\circ}$  to  $+250^{\circ}\text{C}$  can not be explained by changes in the binding force, since  $E$  decreases only by a factor of 2 in the temperature range of  $-196^{\circ}$  to  $+600^{\circ}\text{C}$ . It is assumed that the discontinuity and branching of the slip bonds at higher temperatures and low deformation speeds are connected with an easier shifting of dislocations, not only in the slip band but also in the direction that is perpendicular to the latter. Fractionation of the grains into domains with boundaries formed of dislocations, takes place under the effect of heterogeneous stresses, arising in the grains due to their interaction along the boundaries. Interaction of elastic fields of dislocation with Mg atoms causes accumulation of the latter at the dislocations; this reduces deformations in such spots, diminishing the mobility of dislocations and raising the resistance to deformation of alloys. There are 26 bibliographical titles.

Card 2/2

Yu.L.

YAKOVLIVA, E.S.

5852/2385

**PLEASE I BOOK DEFLATION**

24(6).

an interviewee problem prochnosti tvardogo tela; sbornik stacyi (Some Problems in the Strength of Solids; Collection of Articles) Moscow, Izd-vo AN SSSR, 1999. 386 p. Errata slip inserted. 2,000 copies printed.

Editorial Board: V. F. Ioffe, Academician, U.S.S.R. Academy of Sciences; A. P. Krasovskiy, Corresponding Member, U.S.S.R. Academy of Sciences; P. P. Vlasov, Doctor of Physical and Mathematical Sciences, Professor (M.P.E.); L. A. Rykova, Doctor of Technical Sciences, Professor, Doctor of Physical and Mathematical Sciences, Professor, Doctor of Technical Sciences, Professor, Doctor of Technical Sciences (Deputy M.P.E.).

NOTE: This book is intended for construction engineers, technologists, physicists and other persons interested in the strength of materials.

**NOTES:** This collection of articles was compiled by the Ordentliche Professor Mathematik an der USSR (Department of Physical and Mathematical Sciences) and the Physiko-chemisches Institut an USSR (Institute of Applied Physics, Academy of Sciences, USSR) in commemoration of the 60th birthday of Klavdiey Ivanovich Brindzhanov, Member of the Ukrainian Academy of Sciences, founder and head of the Odessa prochnost' materialy (Department of the Strength of Materials) at the Institute of Applied Physics, Academy of Sciences, USSR, founder of the Nauch'no-fizicheskoye metallofizicheskiy Institut (Institute of Physical Metallurgy) at the Leningradskiy politekhnicheskii Institut (Leningrad Polytechnical Institute), recipient of the Stalin Prize (1941), the Order of the Red Banner of Labor (1945) and the Order of Lenin (1957). The articles deal with the strength of materials, phenomena of imperfect elasticity, creep, brittleness, hydrogen embrittlement, cold brittleness, influences of deformation speed on the mechanical properties of materials, design of metals, and general problems of the strength, plasticity, and mechanical properties of materials. Famous personalities are mentioned in the introductory portion of Professor Brindzhanov. References are given at the end of each article.

Indin, L.A., B.G. Lazarev, Ye.D. Starodubov, and V.I. Zhuravich.  
Fiziko-khimicheskiy institut AN USSR-Institute of Applied Physics,  
Academy of Sciences (Ukr. SSR, Kharkov). Low-temperature polymorphism of  
tals

Director, and E. Ye. Zaslavskiy (Institute of Applied Physics,  
Academy of Sciences, USSR, Leningrad).  
Under Different Load Conditions

Khramov, S. I., T. I. Oudina, A. A. Zhukhovitskiy, and S. E. Khabin.  
Influence of Stresses and Deformation on the Process of Diffusion.

ones, B. Za., and A.P. Shumko (Gosudarstvennyy universitet imeni Oor'kovo, Chark'ov State University Imani Oor'kovo, Chark'ov). Determination Group of  
most Specimens Prepared From Powdered Iron

with the V.I. and L.S. Zakharenko-Institute Field Metallurgy USSR,  
Sverdlovsk-Institute of Metal Physics, Ural Branch, Academy of Sciences,  
Sverdlovsk). Influence of Aluminum and Copper on the Transformation  
Rate?

torova, T.A. (Institut popravodnikov 15 sssr, Leningrad-Semi-  
ductor Institute, Academy of Sciences, USSR, Leningrad). Relationship  
between the Mechanical and Thermal Characteristics of Semiconductors.  
1977. 10 p. 10 refs.

bor, E.J., and I.I. Solchenko (Considerately pedagogical Institute of U.S. University, Dae'yo-Sate Pedagogical Institute Imai  
Suywoda, Dae'lov). Strengthening of Rock Salt Crystals by Re-

Author: M.G., and V.A. Pavlov (Institute for Metal Physics, Czech Republic,  
Academy of Sciences, USSR, Sverdlovsk). Some Aspects of Stress Relaxation  
From: *Int. J.*

Kallio, S.O., and Z.A. Vashchenko (Polytechnic Institute Leningrad, U.S.S.R., Leningrad). Increasing the Elastic Limit and Decreasing the Residual Stress After Effect During Cold Hardening and Tempering of Spring Steels. *Met. Engng.* 1961, No. 1, 10-12.

MAN, L.A., and V.I. Kolesnik (NII po pererabotke nefei i polucheniya  
rastvorimogo shlagogo topliva, g. Leningrad-Scientific Research Insti-  
tute for Petroleum Refining and Production of Synthetic Liquid Fuel,  
Leningrad).

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YAKOVLEV, S.S.

18(7) PHASE I BOOK EXPLOITATION SOV/3355

Academiya nauk SSSR. Institut metallurgii. Nauchnyy sovet po  
probleme zharoprochnykh splavov

Issledovaniya po zharoprochnym splavam, t. IV (Studies on Heat-resistant  
alloys, vol. 4), Moscow, Izd-vo AN SSSR, 1959. 400 p.  
Errata slip inserted. 2,200 copies printed.

Ed. of Publishing House: V. A. Klimov; Tech. Ed.: A. P. Guseva;  
Editorial Board: I. P. Sardin, Academician; G. V. Kurdumov,  
Academician; M. V. Agayev; Corresponding Member, USSR Academy of  
Sciences; I. A. Odintsov; A. M. Pavlov, and I. P. Zudin, Candidate  
of Technical Sciences.

PURPOSE: This book is intended for metallurgists concerned with  
the structural metallurgy of alloys.

COVERAGE: This is a collection of specialized studies of various  
problems in the structural metallurgy of heat-resistant alloys.  
Some are concerned with theoretical principles, some with descriptions  
of new equipment and methods, others with properties  
of specific materials. ~~Wherever possible, the authors have~~  
specified conditions are studied and reported on. For details,  
see Table of Contents. The articles are accompanied by a number  
of references, both Soviet and non-Soviet.

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SOV/3355

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Card 3/12

YAKOVLEVA, E.S.; SYUTKINA, V.I.

Mechanism of high temperature deformation of nickel-aluminum  
and nickel-copper solid solutions. Issl.po sharopr.splav. 4:  
36-40 '59. (MIRA 13:5)

(Deformations (Mechanics)) (Nickel alloys--Metallography)

SOV/126-7-6-21/24

AUTHORS: Syutkina, V.I. and Yakovleva, E. S.

TITLE: Mechanism of High Temperature Deformation of Nickel-Aluminium and Nickel-Copper Solid Solutions

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 6, pp 929-936 (USSR)

ABSTRACT: In this report the results of an investigation of the effect of alloying nickel with aluminium and nickel with copper on the mechanism of deformation are given. The compositions of the investigated alloys are given in the table, p 930. Nickel of 99.99% purity, which had been remelted in vacuum, was used as the basis metal for the preparation of the alloys. The purity of aluminium used was 99.99%, and that of copper, 99.95%. The working specimens were 50 x 2 x 0.3 mm in size. The specimens were annealed so as to obtain the same grain size. The linear grain size was 0.1 mm. The temperature of recrystallization annealing for pure nickel was 800°C, and for the alloys 900-100°C. The specimens were deformed at two temperatures and at two straining rates. The nickel-copper alloys were elongated at 400°C at a

Card 1/5 rate of 0.2%/second by 2 and 12 per cent, and at 700°C

SOV/126-7-6-21/24

Mechanism of High Temperature Deformation of Nickel-Aluminium  
and Nickel-Copper Solid Solutions

at 2 per cent/hour by 2 per cent. In order to prevent oxidation of the specimen surfaces, pulling was carried out in a nitrogen atmosphere. Prior to deformation the specimens were electropolished and etched. The conclusions on the deformation mechanism were arrived at on the basis of results obtained in the microscopic study of the deformed specimen surface, as well as from a study of the extent and form of the radial diffuseness of X-ray interference maxima in Laue photographs. The microscopic study of the surface was carried out by means of the Linnik interferometer MII-1. The Laue picture was taken in a white molybdenum or tungsten irradiation. Under the above conditions of deformation the following processes were found to take place in the alloys: 1. Shear along slip planes. 2. Shear along grain boundaries. 3. Displacement of grain boundaries. 4. Splitting of the grains into blocks. These phenomena occurred after two as well as after 12% deformation. In this paper the results obtained with 2 per cent deformation are mainly

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reported. After straining by 12 per cent, the surface relief was so coarse that quantitative measurements were impossible. In Fig 1a the dependence of shear along the grain boundaries on the composition of nickel-aluminium alloys, and in Fig 1b the dependence of shear along the grain boundaries on the composition of nickel-copper alloys, at various temperatures and deformation rates, are shown. In Fig 2 grain boundary displacement in pure nickel at various temperatures and degrees of deformation is shown. In Fig 3 grain displacement in nickel-aluminium alloys, deformed by 2 per cent at 700°C is shown. Fig 4 shows the grain displacement in nickel-copper alloys under the same conditions. Fig 5 is an X-ray photograph of a 0.5% aluminium alloy, deformed by 2 per cent at 700°C. The authors arrived at the following conclusions:

1. Shear along the grain boundaries and a displacement of boundaries occurs in nickel deformed at a high temperature. Both processes are due to the action of stresses arising in the grain boundaries during

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Mechanism of High Temperature Deformation of Nickel-Aluminium  
and Nickel-Copper Solid Solutions

deformation. They are directional diffusion processes. Shear along grain boundaries is a deformation process which leads to a relaxation of stresses in the grains and to a strengthening of the grain boundaries. The grain bodies are not deformed when the grain boundaries are displaced (Ref 10). This displacement process only leads to a decrease in the stresses which bring it about and to a restoration of the correct structure of the metal crystal.

2. Alloying of nickel with aluminium and copper greatly strengthens the grain boundaries and lowers their mobility. This is due to the fact that diffusion processes in the boundary are rendered more difficult because of the rectification of the lattice due to internal adsorption.

3. Strengthening of the boundaries on alloying is greater than that of the grain bodies. Therefore, in order to strengthen an alloy for service under creep conditions, it is sufficient to add a very small quantity of addition element. However, the grain bodies are only

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Mechanism of High Temperature Deformation of Nickel-Aluminium  
and Nickel-Copper Solid Solutions

slightly strengthened due to such alloying and the grains are easily deformed by splitting up into blocks by polygonisation under load. In order to strengthen the grain bodies the alloy element should be introduced in a considerably greater quantity. It is not recommended that the alloy element should be introduced in such quantities as to greatly decrease the mobility of the grain boundaries, as this tends to make the metal liable to brittle fracture in high temperature deformation. There are 5 figures, 1 table and 10 references, 7 of which are Soviet and 3 English.

ASSOCIATION: Institut fiziki metallov AN SSSR  
(Institute of Metal Physics, Ac.Sc. USSR)

SUBMITTED: April 5, 1958

Card 5/5

9 (6)

AUTHORS:

Shalayev, V. I., Yakovleva, E. S.

SOV/32-25-6-18/53

TITLE:

Determination of the Grain Orientation With Electron Microscopic Photographs of Pickling Patterns (Opredeleniye oriyehtirovki zeren po elektronmikroskopicheskim snimkam figur travleniya)

PERIODICAL:

Zavodskaya Laboratoriya, 1959, Vol 25, Nr 6, pp 699-700 (USSR)

ABSTRACT:

It is sufficient for the determination of the grain orientation to know the indices of the crystallographic elements in the pickling patterns and to have the electron microscopic photograph of the pickling patterns (i.e. an orthogonal projection of the pattern). The photograph permits the measurement of the pattern edge angles, wherefrom (Ref 1) the plane indices may be determined. The grain orientation of polycrystalline samples of aluminum and aluminum-magnesium alloys was determined by this method. The sample surface was polished electrolytically (electrolyte 2/3 methanol, 1/3 nitric acid) and the pickling patterns were developed with the reagent (Ref 2). In contrast to opinions held hitherto it was found that the pickling patterns do not exhibit cube surfaces but a fine pickling structure of

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Determination of the Grain Orientation With Electron Microscopic Photographs of Pickling Patterns SOV/32-25-6-18/53

pyramid surfaces. The surfaces are not entirely even; they exhibit a stepped configuration, the step faces being cube planes. It is stated on the strength of this observation that the determination of grain orientation is thereby rendered more difficult and may be made with a slighter error only in the case when 2 or 3 surfaces of the pickling patterns exhibit similar inclination angles with respect to the sample surface. The electron microscopic photographs shown were taken by V. I. Syutkina. There are 2 figures and 3 references, 1 of which is Soviet.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Metal Physics of the Academy of Sciences, USSR)

Card 2/2

SYUTKINA, V.I.; YAKOVLEVA, E.S.

Effect of the composition of an alloy on the traces of slip in  
alpha-solid solutions of magnesium in aluminum. Fiz. met. i  
metalloved. 10 no.3:481-486 S '60. (MIRA 13:10)

1. Institut fiziki metallov AN SSSR.  
(Magnesium-aluminum alloys--Metallography)  
(Electron microscopy)

YAKOVLEVA, E. S.

Mechanism of the initial stage of deformation. Fiz. met. i  
metalloved 11 no.3:479-480 Mr '61. (MIRA 14:3)

1. Institut fiziki metallov AN SSSR.  
(Deformations(Mechanics))

24-7500 1160 1454

3256  
S/126/61/012/005/016/028  
E091/E335

AUTHORS: Syutkina, V.I. and Yakovleva, E.S.

TITLE: Grain slip and boundary migration in nickel alloys deformed at high temperatures

PERIODICAL: Fizika metallov i metallovedeniye, v.12, no. 5, 1961, 740 - 747

TEXT: The influence of the concentration of alloying elements on the slip and migration of boundaries in the binary solid solutions Ni-Al (0.02 - 3% Al), Ni-Cu (0.1-60% Cu) and Ni-Co (0.5-60% Co) was studied. The low concentration ranges were studied particularly thoroughly since small percentages of alloy elements exert a very strong influence on the properties of grain boundaries. The alloys were made by means of vacuum melting, using metals of 99.99% purity. The average grain size of all alloys was 0.1 mm. The alloys were deformed in tension at a rate of 2% per hour at a temperature of 700 °C. To prevent oxidation of the specimens deformation was carried out in an atmosphere of purified nitrogen. The surface of the specimens was subjected to electrolytic polishing prior to  
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32656

S/126/61/012/005/016/028

E091/E335

Grain slip and ....

deformation. Slip along the boundaries and migration of boundaries was studied by means of an interferometer at a magnification of X320 and by means of an electron microscope at a magnification of X6500 after the specimens had been extended by 2%. The height of the slip steps on the surface, forming during deformation along the boundaries of adjacent grains, was taken as an indication of the degree of slip. This value was measured with an accuracy of up to  $0.1 \mu$ , from the displacement of interference lines. The extent of displacement of the boundaries was judged from the distance between their positions prior to and after deformation, measured along the generatrix of the specimen. This distance was measured, with an accuracy of up to  $1 \mu$ , by means of an ocular scale. The initial position of the boundaries became visible during electrolytic polishing. All subsequent positions became evident owing to slip occurring along the boundaries during deformation. It was found that two regions exist in binary Ni-base  $\alpha$ -solid solutions, in which the concentration of the alloy element exerts a strong influence on the refractory properties of the

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S/126/61/012/005/016/028

EO91/E335

Grain slip and ....

alloy. The first region lies in the interval of dilute solid solution. This region is the narrower the greater the difference in radius, values and position in the periodic table, between the atoms of the alloying elements and those of the basic metal. Addition of alloy elements to nickel within the limits of these concentrations causes strengthening of the grain boundaries, which increases its plasticity and the life under load in high-temperature testing. The second concentration region is situated in an area half-way between the terminal solubilities of the alloying element in nickel. At these concentrations, the mobility of the boundaries decreases and their shape becomes more complex. These factors exert opposite effects on the formation and propagation of cracks along the grain boundaries. The shape of the boundaries is a factor of considerable importance. It suppresses the true influence of decrease in boundary mobility and considerably increases the plasticity and creep resistance of the alloy. A serrated shape of grain boundaries can be brought about during high-temperature deformation by selecting an appropriate percentage of alloying element.

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S/126/61/012/005/016/028

E091/E335

Grain slip and .....

There are 3 figures and 10 references: 7 Soviet-bloc (one of which is a translation of non-Soviet-bloc publication) and 3 non-Soviet-bloc. The English-language references mentioned are: Ref. 6: H.C. Chang, N.J. Grant - J. Metals, 1952, 4, 619; 1953, 5, 305; Ref. 8: N.J. Grant, A.R. Chaudhuri, I.R. Silver, D.C. Canow - Trans. AIMME, 1959, 215, 540. X

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals of the AS USSR)

SUBMITTED: February 27, 1961

Card 4/4

40974

18.8200

S/659/62/009/000/004/030  
I003/I203

AUTHORS: Syutkina, V. I., and Yakovleva, E. S.

TITLE: Slip and grain boundary movements in nickel alloys during high-temperature deformation

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledovaniya po zharoprochnym splavam.  
v. 9. 1962. Materialy Nauchnoy sessii po zharoprochnym splavam (1961 g.), 30-37

TEXT: The influence of the concentrations of alloying element in the binary Ni-Al, Ni-Cu and Ni-Co solid solutions was investigated by an interferometer, electron microscope and by X-ray diffraction. The relationship between the concentrations of the alloying elements and the grain boundary movements is not linear. The minima and maxima are explained by the non-uniform deformation throughout the grain, by the adsorption of impurities along the grain boundaries, and by the formation of blocks of the mosaic structure. In the following discussion, P. A. Kondrat'eva stressed the interest of the results obtained, but pointed out that she had arrived at some different conclusions and suggested that some of the results in this work be checked. There are 2 figures.

Card 1/1

S/181/62/004/010/041/063  
B102/B112

AUTHORS: Syutkina, V. I., and Yakovleva, E. S.

TITLE: Mechanical properties of copper-gold alloys ordering themselves

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2901-2907

TEXT: The effect of the composition and the ordering of high-purity (99.99%) copper-gold alloys with 18, 19, 20, 22, 25, 27, 30, 31, and 33% gold on the mechanical properties was studied. Part of the specimens (40·2·0.5-mm platelets) were left disordered, and the other rest transformed into an ordered state by long-period annealing. In this annealing the temperature was reduced in such a way that the holding times increased with decreasing temperature. Cooling from 410 to 200°C lasted e. g., 230 hrs. In this way a maximum ordering could be achieved as was verified by resistivity determinations. The mechanical properties were determined from the stress-strain diagrams. Type and distribution of the slip traces on the specimen surfaces were studied microscopically. The studies showed that the ordering markedly changes the mechanical properties and the

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Mechanical properties of copper-gold ... S/181/62/004/010/041/063  
B102/B112

deformation mechanism throughout the range of concentration where  $\text{Cu}_3\text{Au}$ -type ordering occurs. The difference in the behavior of ordered and of disordered alloys under loading is explained by pair dislocations in the disordered state being more strongly subject to structural change than the ordinary dislocations when the concentration and the degree of deformation are changed. Not only the dislocation energy but also the structure and the impurity content of the dislocations changes, thus causing a change in the strengthening mechanism. There are 5 figures and 1 table.

ASSOCIATION: Institut fiziki metallov AN SSSR, Sverdlovsk (Institute of the Physics of Metals AS USSR, Sverdlovsk)

SUBMITTED: June 9, 1962

Card 2/2

SYUTKINA, V.I.; YAKOVLEVA, E.S.

Microscopic study of the deformation of ordered alloys. Fiz.met.  
i metalloved. 14 no.5:742-749 N '62. (MIRA 15:12)

1. Institut fiziki metallov AN SSSR.  
(Alloys—Metallography)(Deformations(Mechanics))

L 12476-63

EWP(q)/EWT(m)/BDS

AFFTC

JD

S/185/63/008/003/006/009

AUTHOR: Syutkina, V. I. and Yakovleva, E. S. 56

TITLE: Effect of ordering on the deformation mechanism of Cu-Au and Cu-Pd alloys 27 27 27

PERIODICAL: Ukrains'kyy Fizychnyy Zhurnal, v. 8, no. 3, 1963, 369-373.

TEXT: The effect of ordering<sup>6</sup> on the mechanical properties and deformation mechanism has been investigated very little. In this work an investigation is made throughout the whole concentration range of the existence of Cu<sub>3</sub>M ordering. Copper-gold and copper-palladium alloys were investigated. The nature of distribution of slip traces and investigated by means of optical and electron microscopes. It is shown that in all concentration ranges of the existence of Cu<sub>3</sub>M type ordering, both the deformation mechanism and properties of alloy undergo drastic changes. The results are treated from the viewpoint of the theory of dislocations. The article contains 4 figures and a 13 item bibliography.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of the Metal Physics of the Academy of Sciences of the USSR, Sverdlovsk.)

Card 1/1

GERZHA, L.A.; SYUTKINA, V.I.; YAKOVLEVA, E.S.

Deformation hardening of ordered alloys. Fiz.met. i metalloved. 38  
no.5:770-777 N '64. (MIRA 18:4)

1. Institut fiziki metallöv AN SSSR.

GERZHA, L.A.; SYUTKINA, V.I.; YAKOVLEVA, E.S.

Brittleness of alloys with a face-centered cubic lattice  
ordered according to the AB type. Fiz. met. i metalloved.  
20 no.3:433-441 S '65. (MIRA 18:11)

1. Institut fiziki metallov AN SSSR.

L 22899-65 EWP(k)/EWT(m)/EWP(b)/T/EWA(d)/EWP(t) Pf-4 IJP(c) JD/HW  
ACCESSION NR: AP5001247 S/0126/64/018/005/0770/0777

AUTHOR: Gerzha, L.A.; Syutkina, V.I.; Yakovleva, E.S.

TITLE: Strain hardening of ordered alloys 4

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 5, 1964, 770-777

TOPIC TAGS: ordered alloy, alloy hardening, strain hardening, copper alloy, gold alloy, alloy conductivity, lead alloy

ABSTRACT: An attempt was made to check experimentally the magnitude of hardening caused by the intersection of dislocations with domain boundaries. To this end, the dependence of the hardening of an ordered alloy,  $\text{Cu}_3\text{Au}$ , on the size of the domains was studied by reducing the size of the domains, which was followed by means of changes in the electrical resistance of the alloy. The hardening coefficient was determined as a function of the size of the domains in  $\text{Cu}_3\text{Au}$  and compared to the hardening coefficient of  $\text{Cu}_3\text{Pd}$ . Mechanisms are discussed which could account for the high degree of hardenability of alloys deformed by paired dislocations. It was shown experimentally that in ordered alloys, strain hardening due to an increase in the extent of antiphased boundaries

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L 22899-65

ACCESSION NR: AP5001247

and involving the intersection of dislocations with domain boundaries is so slight that it can be neglected in analyzing the causes of the hardening of such alloys. Orig. art. has: 5 figures and 3 formulas.

ASSOCIATION: Institut fiziki metallov AN SSSR (Metal physics institute, AN SSSR)

SUBMITTED: 10Mar64

ENCL: 00

SUB CODE: MM

NO REF SOV: 009

OTHER: 015

Card 2/2

BARER, A.S.; YAKOVLEVA, E.V.

Change in the content of sodium and potassium ions in human urine and saliva during "elevations" to altitudes of 5,000 and 6,000 m. in a pressure chamber. Biul. eksp. biol. i med. 53 no.1:63-65 Ja '62. (MIRA 15:3)

1. Predstavlena deystvitel'nym chlenom AMN SSSR S.Ye. Severinym.

(ALTITUDE, INFLUENCE OF)  
(SALIVA)  
(URINE--ANALYSIS AND PATHOLOGY)

SUMAROKOVA, T.; YAKOVLEVA, F.

Acids, Organic

Complex compounds  $\text{SnCl}_4$ ,  $\text{SbCl}_3$ , and  $\text{AsCl}_3$  with some organic acids, Izv. Sek. plat. i blag. met. No. 25, 1950.

Monthly List of Russian Accessions, Library of Congress, April 1952. Unclassified.

YAKOVLEVA, F.; SUMAROKOVA, T.

Binary systems formed by  $\text{SnCl}_4$  with carboxylic acids of the aliphatic series.  
Report no.1. Izv.AN Kazakh.SSR no.118:39-53 '53. (MLBA 6:10)  
(Systems (Chemistry)) (Stannic chloride) (Carboxylic acids)

YAKOVILEVA, F.; SUMAROKOVA, T.

Binary systems formed by  $\text{SnCl}_4$  with carboxylic acids of the aliphatic series.  
Report no.2. Izv. AN Kazakh SSR no.118:54-68 '53. (MIRA 6:10)  
(Systems (Chemistry)) (Stannic chloride) (Carboxylic acids)

YAKOVLEVA, G. A.

Nov 48

USSR/Engineering  
Mechanization  
Fuel Conservation

"Mechanization of the Operations for Building Earth Beds for Automobile Roads," A. A. Arsen'yov, N. A. Rozov, G. A. Yakovleva, Engineers, 4 pp

"Mech Trud i Tyazh Rabot" No 11

Describes proposals for mechanizing many processes for building beds of type-3 paved automobile roads (roadbed 10 meters with a 6-meter-wide macadam road on a crushed rock base). Diagram shows cross section of the road. Conducted tests to save fuel and determine best methods for using available equipment with very satisfactory results. Recommends using facts obtained by experiment in other road-building projects.

PA 53/49T40

POGOBELOVA, T.I.; GRACHEVA, A.L.; MASHTAKOVA, P.A.; TIMOSHENKO, A.P.;  
YAKOVLEVA, G.A.; SHUBAYEVA, S.M.; SERGEYEV, Ye.V.; LACHUGINA,  
V.A.; KOMSOMOL'TSEVA, L.I., red.; TOCHENYY, N.S., red.;  
GIL'DEBRANT, Ye., tekhn. red.

[Economy of Krasnoyarsk Territory; a statistical manual] Narodnoe  
khoziaistvo Krasnoiarskogo kraia; statisticheskii sbornik.  
Krasnoiarsk, 1958. 332 p. (MIRA 11:10)

1. Krasnoyarsk (Kray). Statisticheskoye upravleniye. 2. Nachal'nik  
Statisticheskogo upravleniya Krasnoyarskogo kraya (for Tochenyy).  
(Krasnoyarsk Territory--Statistics)

YAKOVLEVA, G.A.; inzh.; ZOTOVA, A.S., inzh.

Selecting an efficient type of cement concrete plant. Avt.dor.  
25 no.1:15-16 Ja '62. (MIRA 15:2)  
(Concrete plants)

RITOV, Maks Nikolayevich, kand. tekhn. nauk; YAKOVLEVA, Galina  
Aleksandrovna, inzh.; IL'INA, L.N., red.

[Analysis of the use of machinery in road construction]  
Analiz ispol'zovaniia mashin na dorozhnom stroitel'stva.  
Moskva, Transport, 1965. 78 p. (MIRA 18:4)

40396  
S/109/62/007/009/005/018  
D409/D301 17

20.2312  
20.2311  
AUTHORS: Gor'kov, V.A., Yelinson, M.I., and Yakovleva, G.D.

TITLE: Theoretical and experimental investigation of pre-arc effects in field emission

PERIODICAL: Radiotekhnika i elektronika, no. 9, v. 7, 1962, 1501 - 1510

TEXT: A more advanced theory of the vacuum arc is developed which takes into account the temperature dependence of the parameters of the emitter and is adequate for a wider range of variation of the geometrical parameters of the emitter. The heat-balance equation for conical emitters is derived. After transformations, this equation becomes

$$\frac{\partial^2 T}{\partial r^2} + \frac{2}{r} \frac{\partial T}{\partial r} - \varphi_1(T) \frac{\partial T}{\partial t} - \varphi_2(T) \frac{1}{r} + \varphi_3(T) \frac{1}{r^4} = 0, \quad (7)$$

where  $\varphi_1$  is related to the specific heat,  $\varphi_2$  to the radiation coefficient, and  $\varphi_3$  to the current intensity and resistivity; r denotes Card 1/3

Theoretical and experimental ...

S/109/62/007/009/005/018  
D409/D301

the emitter radius. Equation (7) was solved by numerical methods. The dependences  $T = f(t)$  and  $T = f(r)$  were calculated for various values of  $I$ ; thereby the parameter  $\theta$  (the semiangle of the emitter cone), assumed the following values: 5; 15; 25; 35 and 45°. The current density  $j$  equalled  $2 \cdot 10^8$  A/cm<sup>2</sup>. The above theoretical considerations were compared with experiment. The theoretical and experimental curves were in good qualitative agreement; the quantitative discrepancies are apparently due to various factors which are not taken into account by theory (the damping effect of the space charge, the use of the mean current-density instead of the actual current density, etc.). The theoretical calculations for small semiangles  $\alpha$  ( $< 30^\circ$ ), are qualitatively in agreement with the results of W.P. Dyke a. oth., (Ref. 1: Phys. Rev., 1953, 91, 5, 1043). For values of  $\alpha > 30^\circ$ , the authors obtained a stronger dependence of the critical current-density  $j_{crit}$  on  $\alpha$ . The theoretical and experimental curves  $j_{crit} = \varphi(\alpha)$  and  $j = \varphi(t)$  with  $U = \text{const.}$ , were in good agreement. No use of self-heating effects can be made, in view of the instability of the processes involved. In practice, it is most convenient to use emitters with large semiangle ( $\alpha = 90^\circ$  and

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above). Such cathodes have great stability in the "vacuum" arc, small emission-angles and considerable operating current-densities. There are 10 figures.

SUBMITTED: January 12, 1962

Card 3/3

YAKOVLEVA, G.D.; YAKOVLEV, O.I.; ROGASHKOVA, A.I.

Doppler effect in nonuniform media. Radiotekh. i elektron. 8  
no.3:416-424 Mr '63. (MIRA 16:3)  
(Doppler effect) (Electromagnetic waves)

YAKOVLEVA, G. F.

Yakovleva, G. F.--"Conditions for the existence of Periodic Solutions of Several Classes of Integral-Differential Equations With Constant Coefficients." Cand Phys-Math Sci, Inst of Mathematics and Mechanics, Acad Sci Uzbek SSR, Tashkent 1953. (Referativny Zhurnal--Matematika)(Jan 1954)

SO: SUM 168, 22 July 1954

SOV/124-58-1-1025

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 134 (USSR)

AUTHOR: Yakovleva, G. F.

TITLE: Conditions of Periodicity of Forced Longitudinal, Transverse, and Torsional Vibrations of Bars With Consideration of Aftereffect  
(Usloviya periodichnosti vynuzhdennykh prodol'nykh, poperechnykh i krutil'nykh kolebaniy sterzhnya s uchetom posledeystviya)

PERIODICAL: Tr. In-ta matem. i mekhan. AN UzSSR, 1955, Nr 16, pp 126-138

ABSTRACT: The author performs an investigation of the vibratory elastic motion of a thin bar the material of which exhibits memory properties. In each of the cases relative to the longitudinal, transversal, and torsional vibrations the author sets up an integral-differential equation issuing from the general memory theory of Boltzmann-Volterra. The solution of the equations obtained for a characterization of the vibration are preceded by a broad investigation of the general integral-differential equation and by the establishment of the conditions for the existence of periodic solutions for this equation. On the basis of the theorems adduced and assuming the coefficients of memory to be exponential the author finds for each of the three cases the displacement function in the form of a sum of the

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SOV/124-58-1-1025

Conditions of Periodicity of Forced Longitudinal (cont.)

derivatives with respect to the time and the coordinates. These solutions, as was to be expected, contain trigonometric functions in all cases.

A. P. Bronskiy

Card 2/2

16(1)

06552

AUTHORS: Yakovleva, G.F., and Misnik, V.P. SOV/166-59-4-3/10

TITLE: Conditions for the Existence of Periodic Solutions of a Class of Nonlinear Systems of Integro-Differential Equations

PERIODICAL: Izvestiya Akademii nauk Uzbekskoy SSR, Seriya fiziko-matematicheskikh nauk, 1959, Nr 4, pp 16-25 (USSR)

ABSTRACT: Given the system

$$(1) \quad \frac{dx_s}{dt} = \sum_{i=1}^n a_{si} x_i + f_s(x_1, \dots, x_n) + \mu \int_a^b K_s(t, \tau, x_1, \dots, x_n) d\tau$$

(s=1, 2, \dots, n),

where  $a_{si}$  are constants,  $|a_{si}| \leq a^*$ ,

$$(2) \quad f_s = \sum_{v_1 + \dots + v_n = 2}^{\infty} \bar{p}_s^{(v_1, \dots, v_n)} x_1^{v_1}(t) \dots x_n^{v_n}(t)$$

and

$$(3) \quad K_s = \sum_{v_1 + \dots + v_n = 0}^{\infty} \bar{q}_s^{(v_1, \dots, v_n)}(t, \tau) x_1^{v_1}(\tau) \dots x_n^{v_n}(\tau),$$

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Conditions for the Existence of Periodic Solutions SOV/166-59-4-3/10  
of a Class of Nonlinear Systems of Integro-  
Differential Equations

where  $K_s$  are continuous periodic functions of  $t$  the Fourier series of which converge uniformly.

Theorem 1: Let  $f_s$  and  $K_s$  be analytic in  $|x_s| \leq \bar{r}$ , where their series developments begin with terms of second order. Let the characteristic equation  $|Q - \lambda E| = 0$  of (1), where  $Q = \|a_{si}\|$ , have only roots the real parts of which vanish or are negative. Let the elementary divisors corresponding to the purely imaginary roots be of first order. Then (1) has a unique solution satisfying the initial conditions

$$(4) \quad x_s(t, \beta_1, \dots, \beta_n, \mu) \Big|_{t=0} = \beta_1.$$

The solution is analytic in a neighborhood of  $\beta_1 = \beta_2 = \dots = \beta_n = \mu = 0$  and vanishes for  $\beta_1 = \dots = \beta_n = \mu = 0$ .

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Conditions for the Existence of Periodic Solutions SOV/166-59-4-3/10  
of a Class of Nonlinear Systems of Integro-  
Differential Equations

Theorem 2: Let the characteristic equation  $|A - \lambda E| = 0$  of (1) have no roots  $\pm \frac{2\pi}{\omega} \cdot p$ , where  $p=0,1,2,\dots$  and  $\omega$  is the period of  $K_s$ . Let the shortened system

$$(12) \quad \frac{dy_s}{dt} = \sum_{i=1}^n a_{si} y_i \quad (s=1,2,\dots,n)$$

have a bounded fundamental system of solutions. Then (1) has a unique periodic solution with the period  $\omega$  which vanishes for  $\mu = 0$  and is analytic in the neighborhood of  $\mu = 0$ .

The third theorem treats the case where the characteristic equation has one root of the type  $\frac{2\pi}{\omega} K_1$ . Two examples are given.

There are 2 Soviet references.

ASSOCIATION: Kirgizskiy Gosuniversitet (Kirghiz State University)

SUBMITTED: February 23, 1959

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37612

16.4500

S/044/62/000/004/054/099  
C111/C333

AUTHOR: Yakovleva, G.F.

TITLE: On the construction of the solution of a class of integro-differential equations with lagging argument

PERIODICAL: Referativnyy zhurnal, Matematika, no. 4, 1962, 59, abstract 4B269. ("Issled. po integro-differents.uravneniyam v Kirgizii". No. I. Frunze, AN KirgSSR, 1961, 167-176) f

TEXT: With the aid of the operational calculus the author constructs the solution of the equation

$$Z[x(t)] + N[x(t - \tau)] + \int_0^t K(t - s)M[x(s)] ds = F(t)$$

which satisfies certain additional conditions. It is assumed that 1) Z, N, M are linear differential operators with constant coefficients and with orders n, n, m ; 2.) K(x) is a quasipolynomial with respect to x.

[Abstracter's note : Complete translation.]

Card 1/1

YAKOVLEVA, G.K.

KOZHINA, V.G., studentka; YAKOVLEVA, G.K.; NAPALKOV, P.N., professor, zaveduyushchiy.

Effect of the patient's position on the operating table upon the activity of the heart and lungs. Vest.khir. 73 no.3:50-55 My-Je '53. (MLRA 6:6)

1. Fakul'tetskaya khirurgicheskaya klinika Leningradskogo sanitarnogigiyenicheskogo meditsinskogo instituta. (Surgery, Operative)

S/125/63/000/003/007/012  
A006/A101

AUTHORS: Chemadurova, Ye. Yu., Yakovleva, G. N.

TITLE: Corrosion resistance of stainless steel pipes welded by the argon-arc method

PERIODICAL: Avtomaticheskaya svarka, no. 3, 1963, 56 - 61

TEXT: The investigation was made with 38.0 x 2.5 mm pipes of steel grades 1X18H9 T (1Kh18N9T), 0X18H9 T (0Kh18N9T), and 00X18H12T (00Kh18N12T). The tests were performed in 65%-nitric acid and in an acid solution of copper vitriol by the AM method (GOST 6032-58). Besides determining loss in weight (method "D") and intercrystalline cracks in Z-shaped bending (AM method) specimens subjected to boiling were metallographically analyzed. Welded specimens were heated in a laboratory electric furnace and welded pipes in an intermediate roller gas-furnace. Total preheating time was 55 min; holding time - 7 to 8 minutes. Prior to the tests all the specimens were subjected to additional two-hour provoking tempering at 650°C. The tests yielded the following results. 00Kh18N12T steel pipes, welded by the argon-arc method, are after quenching from 1,050 - 1,100°C

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Corrosion resistance of stainless steel pipes...

S/125/63/000/003/007/012  
A006/A101

not prone to intercrystalline corrosion in nitric acid (D method) and sulfuric-acid solution (AM method). Welded 0Kh18N9T pipes with about 0.06% C and sixfold titanium content in respect to carbon, can be used as a finished product after heat treatment in an intermediate roller furnace with 7 - 8 min. holding time at temperatures not exceeding 1,100°C. If during the testing of these pipes by the D method, the corrosion rate exceeds 1.0 g/m<sup>2</sup>·hr they should be used as blanks for cold rolling. Welded 1Kh18N9T steel pipes with about 0.1% C, are as a rule, prone to intercrystalline corrosion. There are 8 figures and 1 table.

ASSOCIATION: Dnepropetrovskiy nauchno-issledovatel'skiy trubnyy institut  
(Dnepropetrovsk Scientific-Research Institute of Pipes)

SUBMITTED: July 13, 1962

Card 2/2

S/125/63/000/004/008/011  
D040/D112

AUTHORS: Chemadurova, Ye.Yu., and Yakovleva, G.N.

TITLE: Effect of cold deformation on the tendency to intercrystalline corrosion in welded pipes of OKh18N9T steel

PERIODICAL: Avtomaticheskaya svarka, no. 4, 1963, 73-77

TEXT: The effect of cold deformation on the tendency to intercrystalline corrosion was tested in specimens of pipes produced by argon arc welding of OX 18N9T (OKh18N9T) steel strips which were then cold rolled. The specimens were heat-treated both before and after the rolling, which was performed with various degrees of reduction. The three melts of OKh18N9T steel used for the experiments had the following composition:

	(%)	C	Cr	Ni	Mn	Ti	P	S	Si
A		0.08	17.95	10.47	1.25	0.43	0.027	0.009	0.35
B		0.10	17.66	10.05	1.44	0.53	(Was not determined)		
C		0.061	17.8	10.2	1.35	0.61 <sub>total</sub> (0.23 <sub>bound</sub> )	"	"	0.73

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S/125/63/000/004/008/011  
D040/D112

Effect of cold deformation on . . .

Inter-crystalline corrosion tests were standard, in boiling 65% (mass concentration) nitric acid. The results of the experiments proved that rolling welded pipe blanks with a 40 to 60% reduction makes the weld metal resistant to inter-crystalline corrosion, while lower reduction degrees had no such effect. Increasing the carbon content to 0.1% intensified the corrosion. There are 4 figures and 4 tables.

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy trubnyy institut  
(Ukrainian Scientific Research Institute of Pipes)

SUBMITTED: July 13, 1962

Card 2/2

SHCHESNO, L.P.; CHEMADUROVA, Ye.Yu.; YAKOVLEVA, G.N.; BRECHKEVICH, V.V.

Methods of determining resistance to intercrystallite corrosion  
of electrically welded pipes. Avtom. svar. 16 no.7:90-94 J1 '63.  
(MIRA 16:8)

1. Ukrainskiy nauchno-issledovatel'skiy trubnyy institut.  
(Pipe, Steel--Corrosion)  
(Steel, Stainless--Corrosion)

L 8636-65 EWT(m)/EWP(w)/T/EWP(k)/EWP(b) Pf-4 RAEM(t) MJW/JD/HW/

WB

ACCESSION NR: AP4041863

S/0125/64/000/007/0079/0082

AUTHOR: Donskoy, O. V. (Engineer); Chernadurova, Ye. Yu. (Engineer); Yakovleva, G. N. (Engineer)

TITLE: Effect of electrohydraulic finishing on the tendency of OKh18Ni10T steel pipes toward intergranular corrosion

SOURCE: Aviatsionnaya svarka, no. 7, 1964, 79-82

TOPIC TAGS: electrohydraulic finishing, OKh18Ni10T steel, intergranular corrosion, welding, weld surface finishing, milling, heat treating, metal electroprocessing, microstructure

ABSTRACT: It was found that finishing the external surface of welds by the electrohydraulic method reduced the intergranular corrosion of the welded pipes as tested by the AM and D (GOST 6032-58) methods. The method used has been described by A. L. Vishinskiy (Novoye v razmeroy elektroobrabotke metallov "Innovations in the Electric Discharge Machining of Metals," IDWTP, L. 1962). In this electrohydraulic method the pipe is passed through a mounted multistage cathode at a speed as high as 2 m/min.; and the outer layer of the weld is removed at a high current density in conjunction with a high rate of

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ACCESSION NR: AP4041863

electrolysis. Comparative tests between the electrohydraulic removal and milling (with a hard-wire brush) of the welded seams were run on OKh18N10T steel pipes prepared for the AM test by annealing at 1080C for 10 min. followed by quenching and holding at 650C for 2 hours, and for the D test by annealing at 1050 and 1100C for 10 min. followed by quenching. The microstructure of the surface of the milled welds showed ruptures and physical defects which tend toward intergranular corrosion. Electrohydraulic treatment eliminated these defects leaving a smooth clean surface. In the AM test, when the M/C ratio in the weld after heat treatment was 4, no corrosion was observed. In the D test the corrosion rate of the metal annealed at 1050C was about the same in the first cycle for the milled and the electrohydraulically finished pipes, and was progressively increased in the second and third cycles in the milled pipes; the corrosion rate of the metal annealed at 1100C and subjected to the electrohydraulic finishing was about one-half that of the milled pipes. Orig. art. has: 3 tables and 4 figures.

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy trubnyy institut (Ukrainian Scientific-Research Pipe Institute)

SUBMITTED: 30Sep63

ENCL: 00

SUB CODE: MM

NO REF SCW: 002

OTHER: 000

Card 2/2

CHERKINSKIY, S.N., prof.; DIKUN, P.P., kand.fiziko-matem.nauk; YAKOVLEVA, G.P.,  
aspirant

Investigation of carcinogenic substances in sewage from certain  
industries. Gig. i san. 24 no.9:11-14 S '59. (MIRA 13:1)

1. Iz kafedry kommunal'noy gigiyeny I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M. Sechenova i laboratorii eksperimental'noy onkologii Instituta onkologii AMN SSSR. 2. Chlen-korrespondent AMN SSSR (for Cherkinskiy).

(CARCINOGENS)

(SEWAGE chem.)

YAKOVLEVA, G.P., mladshiy nauchnyy sotrudnik

Decontamination of water containing Mycobacterium tuberculosis.  
Gig.i san. 26 no.3:9-15 Mr '61. (MIRA 14:7)

1. Iz kafedry kommunal'noy gigiyeny I Moskovskogo ordena Lenina  
meditsinskogo instituta imeni I.M.Sechenova.  
(WATER-CHLORINATION) (MYCOBACTERIUM TUBERCULOSIS)

EL'PINER, L.I., starshiy nauchnyy sotrudnik; YAKOVLEVA, G.P., mladyshey  
nauchnyy sotrudnik

Experimental studies on decontamination of water containing  
Mycobacterium tuberculosis by means of ultrasonics and chlorination.  
Gig. i san. 26 no.6:8-14 Je '61. (MIRA 15:5)

1. Iz TSentral'noy nauchno-issledovatel'skoy laboratorii gigiyeny  
vodnogo transporta i iz kafedry kommunal'noy gigiyeny I Moskovskogo  
ordena Lenina meditsinskogo instituta imeni Sechenova.

(WATER--CHLORINATION) (MYCOBACTERIUM TUBERCULOSIS)  
(ULTRASONIC WAVES--PHYSIOLOGICAL EFFECT)

MIKLASHEVSKIY, V.Ye.; TUGARINOVA, V.N.; YAKOVLEVA, G.P.; ALEKSEYEVA, N.P.;  
RAKHMANINA, N.L.

Experimental basis for the permissible concentration of  
trichloroethylene in bodies of water. San.okhr.vod.ot zagr.prom.  
stoch.vod no.5:308-325 '62. (MIRA 17:6)

1. Kafedra kommunal'noy gigiyeny I. Moskovskogo ordena Lenina  
meditsinskogo instituta imeni I.M. Sechenova.

TUGARINOVA, V.N.; MIKLASHEVSKIY, V.Ye.; ALEKSEYEVA, N.P.; YAKOVLEVA, G.P.

Experimental basis for the permissible concentration of  
tetrachloroethane and hexachloroethane in bodies of water.  
San.okhr.vod.ot zagr.prom.stoch.vod no.5:285-307 '62.

(MIRA 17:6)

1. Kafedra kommunal'noy gigiyeny I Moskovskogo ordena Lenina  
meditsinskogo instituta imeni I.M.Sechenova.

YAKOVLEV, G. S.

Amperometric titration of phosphate ion. V. F. Toropova and G. S. Yakovleva. *Zhur. Anal. Khim.* 1, 200-4 (1940).— $\text{PO}_4$  ion was successfully titrated electro-  
metrically with a standard  $\text{Pb}(\text{OAc})_2$  soln. in an atm. of  $\text{H}_2$ . The circuit contained a potentiometer and a gal-  
vanometer. The titration was carried out at 0.8 v. In a  
pH range 6-7.5, the results were satisfactory; the max.  
relative error was 0.8%. At pH < 5, or > 8, the results  
are too low. Mixts. of  $\text{PO}_4$  ion and  $\text{SO}_4$  ion can be titrated  
with  $\text{Pb}(\text{OAc})_2$  soln. to get the sum of both and then the  
former can be pptd. as  $\text{MgNH}_4\text{PO}_4 \cdot 6\text{H}_2\text{O}$  and the  $\text{SO}_4$  ion  
alone detd. in an aliquot of the supernatant soln. Satis-  
factory results were obtained only at pH 3-4. M. H. H.

Lab. Analyst. Chem., Kazan State U.

YAKOVLEVA, G. S.

Yakovleva, G. S. -- "Diphtheroid Bacteria of the Pharynx and Nose of Healthy Individuals, Diphtheria Patients, and Bacillus Carriers in the Plan of a More Precise Bacteriological Diagnosis of Diphtheria." Min Public Health RSFSR, Leningrad Sanitary Hygienic Med Inst, Leningrad, 1955 (Dissertation for the Degree of Candidate of Veterinary Sciences)

SO: Knizhnaya Letopis', No. 24, Moscow, Jun 55, pp 91-104